No.EX※※-OMU1012

Operation Manual

PRODUCT NAME

SI unit for CC-Link IE Field

MODEL / Series / Product Number

EX250-SCF1-X200

SMC Corporation

Table of Contents

Refer to the operation manual EX250-IE1/-IE2/-IE3 for the input block specifications, and EX9-OET1/-OET2/-OEP1/-OEP2/-PE1 for the output block and power block specifications.

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage.
These instructions indicate the level of potential hazard with the labels of "Caution", "Warning" or "Danger".
They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems.
ISO 4413: Hydraulic fluid power -- General rules relating to systems.
IEC 60204-1: Safety of machinery -- Electrical equipment of machines .(Part 1: General requirements)
ISO 10218-1992: Manipulating industrial robots -Safety.
etc.

⚠ **Caution**	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
⚠ **Warning**	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Danger**	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.
The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.
This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly.
The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Safety Instructions

⚠Caution

1.The product is provided for use in manufacturing industries.
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered,whichever is first.∗2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.
∗2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are govemed by the relevant security laws and regulation of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules goveming that export are known and followed.

Operator

- ♦This operation manual is intended for those who have knowledge of machinery using pneumatic equipment, and have sufficient knowledge of assembly, operation and maintenance of such equipment. Only those persons are allowed to perform assembly, operation and maintenance.
- ♦Read and understand this operation manual carefully before assembling, operating or providing maintenance to the product.

■Safety Instructions

⚠Warning

■Do not disassemble, modify (including changing the printed circuit board) or repair.
An injury or failure can result.

■Do not operate the product outside of the specifications.
Do not use for flammable or harmful fluids.
Fire, malfunction, or damage to the product can result.
Verify the specifications before use.

■Do not operate in an atmosphere containing flammable or explosive gases.
Fire or an explosion can result.
This product is not designed to be explosion proof.

■If using the product in an interlocking circuit:
•Provide a double interlocking system, for example a mechanical system.
•Check the product regularly for proper operation.
Otherwise malfunction can result, causing an accident.

■The following instructions must be followed during maintenance:
•Turn off the power supply.
•Stop the air supply, exhaust the residual pressure and verify that the air is released before performing maintenance.
Otherwise an injury can result.

⚠Caution

■After maintenance is complete, perform appropriate functional inspections.
Stop operation if the equipment does not function properly.
Safety cannot be assured in the case of unexpected malfunction.

■Provide grounding to assure the noise resistance of the Serial System.
Individual grounding should be provided close to the product with a short cable.

■NOTE

Follow the instructions given below when designing, selecting and handling the product.

●The instructions on design and selection (installation, wiring, environment, adjustment, operation, maintenance, etc.) described below must also be followed.

∗Product specifications

•When conformity to UL is required, the SI unit should be used with a UL1310 Class 2 power supply.

•The SI unit is a UL approved product only if they have a c UL us mark on the body.

•Use the specified voltage.

Otherwise failure or malfunction can result.

•Reserve a space for maintenance.

Allow sufficient space for maintenance when designing the system.

•Do not remove any nameplates or labels.

This can lead to incorrect maintenance, or misreading of the operation manual, which could cause damage or malfunction to the product.

It may also result in non-conformity to safety standards.

●Product handling

∗Installation

•Do not drop, hit or apply excessive shock to the fieldbus system.

Otherwise damage to the product can result, causing malfunction.

•Tighten to the specified tightening torque.

If the tightening torque is exceeded the mounting screws may be broken.

IP67 protection cannot be guaranteed if the screws are not tightened to the specified torque.

•Never mount a product in a location that will be used as a foothold.

The product may be damaged if excessive force is applied by stepping or climbing onto it.

∗Wiring

•Avoid repeatedly bending or stretching the cables, or placing heavy load on them.

Repetitive bending stress or tensile stress can cause breakage of the cable.

•Wire correctly.

Incorrect wiring can break the product.

•Do not perform wiring while the power is on.

Otherwise damage to the fieldbus system and/or I/O device can result, causing malfunction.

•Do not route wires and cables together with power or high voltage cables.

Otherwise the fieldbus system and/or I/O device can malfunction due to interference of noise and surge voltage from power and high voltage cables to the signal line.

Route the wires (piping) of the fieldbus system and/or I/O device separately from power or high voltage cables.

•Confirm proper insulation of wiring.

Poor insulation (interference from another circuit, poor insulation between terminals, etc.) can lead to excess voltage or current being applied to the product, causing damage.

•Take appropriate measures against noise, such as using a noise filter, when the fieldbus system is incorporated into equipment.

Otherwise noise can cause malfunction.

∗Environment

•Select the proper type of protection according to the environment of operation.

IP67 protection is achieved when the following conditions are met.

(1) The units are connected properly with fieldbus cable with M12 connector and power cable with M12/M8 connector.

(2) Suitable mounting of each unit and manifold valve.

If using in an environment that is exposed to water splashes, please take measures such as using a cover.

•Do not use in a place where the product could be splashed by oil or chemicals.

If the product is to be used in an environment containing oils or chemicals such as coolant or cleaning solvent, even for a short time, it may be adversely affected (damage, malfunction etc.).

•Do not use the product in an environment where corrosive gases or fluids could be splashed.

Otherwise damage to the product and malfunction can result.

•Do not use in an area where surges are generated.

If there is equipment which generates a large amount of surge (solenoid type lifter, high frequency induction furnace, motor, etc.) close to the SI unit, this may cause deterioration or breakage of the internal circuit of the SI unit. Avoid sources of surge generation and crossed lines.

•When a surge-generating load such as a relay or solenoid is driven directly, use an SI unit with a built-in surge absorbing element.

Direct drive of a load generating surge voltage can damage the SI unit.

•The product is CE marked, but not immune to lightning strikes. Take measures against lightning strikes in the system.

•Prevent foreign matter such as remnant of wires from entering the SI unit to avoid failure and malfunction.

Otherwise failure or malfunction can result.

•Mount the product in a place that is not exposed to vibration or impact.

Otherwise failure or malfunction can result.

•Do not use the product in an environment that is exposed to temperature cycle.

Heat cycles other than ordinary changes in temperature can adversely affect the inside of the product.

•Do not expose the product to direct sunlight.

If using in a location directly exposed to sunlight, shade the product from the sunlight.

Otherwise failure or malfunction can result.

•Keep within the specified ambient temperature range.

Otherwise malfunction can result.

•Do not operate close to a heat source, or in a location exposed to radiant heat.

Otherwise malfunction can result.

∗Adjustment and Operation

•Set the switches by using a sharp-pointed screwdriver etc.

It may damage set switches.

•Perform settings suitable for the operating conditions.

Incorrect setting can cause operation failure.

For details of each setting, refer to page 14 of this manual.

•Please refer to the PLC manufacturer's manual etc. for details of programming and addresses.

For the PLC protocol and programming refer to the relevant manufacturer's documentation.

∗Maintenance

•Turn off the power supply, stop the supplied air, exhaust the residual pressure and verify the release of air before performing maintenance.

There is a risk of unexpected malfunction.

•Perform regular maintenance and inspections.

There is a risk of unexpected malfunction.

•After maintenance is complete, perform appropriate functional inspections.

Stop operation if the equipment does not function properly.

Otherwise safety is not assured due to an unexpected malfunction or incorrect operation.

•Do not use solvents such as benzene, thinner etc. to clean the each unit.

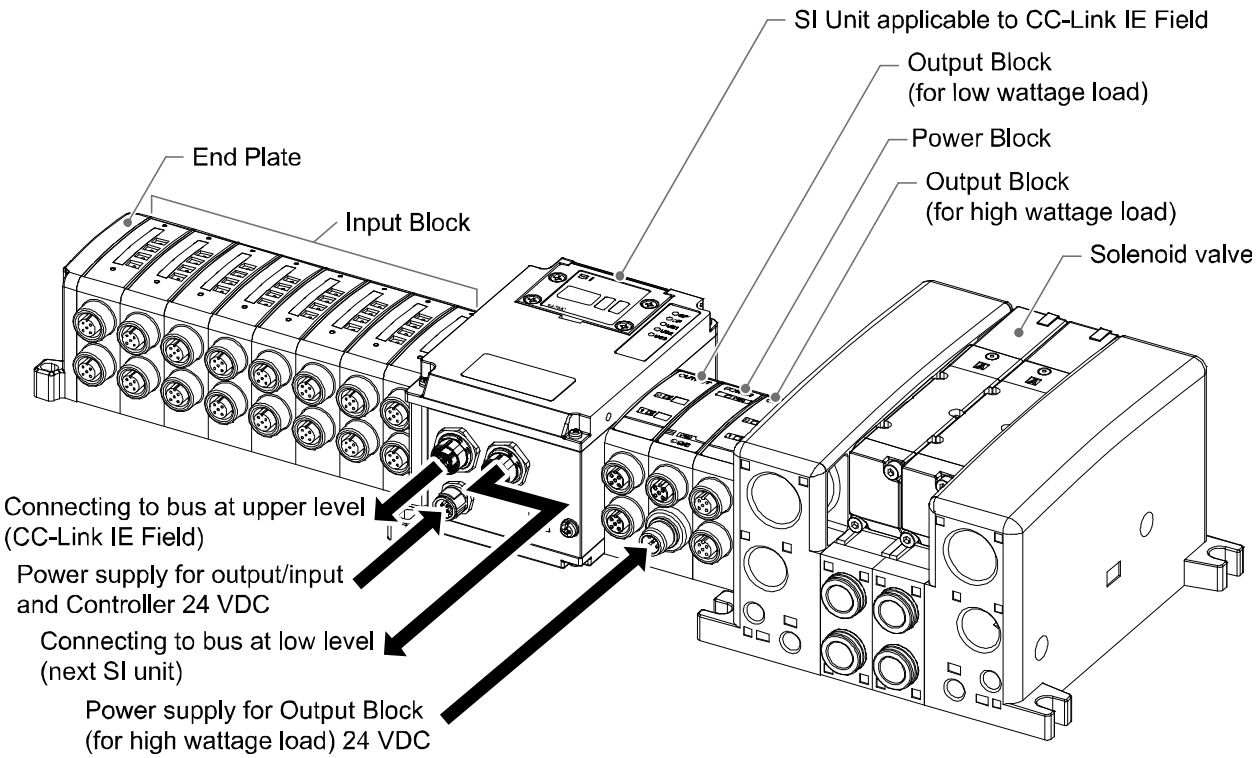
They could damage the surface of the body and erase the markings on the body.

Use a soft cloth to remove stains.

For heavy stains, use a cloth soaked with diluted neutral detergent and fully squeezed, then wipe up the stains again with a dry cloth.

Product Summary

System configuration



This system realizes the reduce wiring between the input and output equipment by connecting to CC-Link IE Field.
CC-Link IE Field and the input and output equipment communicate through the SI unit.
Up to 32 inputs can be connected to the SI unit using Input blocks.
Up to 32 outputs * from combined EX9 Output blocks and valve manifolds can be connected to the SI unit.

∗1: The maximum output point is 24 when the Power block is connected.
∗2: Refer to the operation manual EX※※-OME0002 for the input block specifications, and EX※※-OMH0005 for the output block and power block specifications.

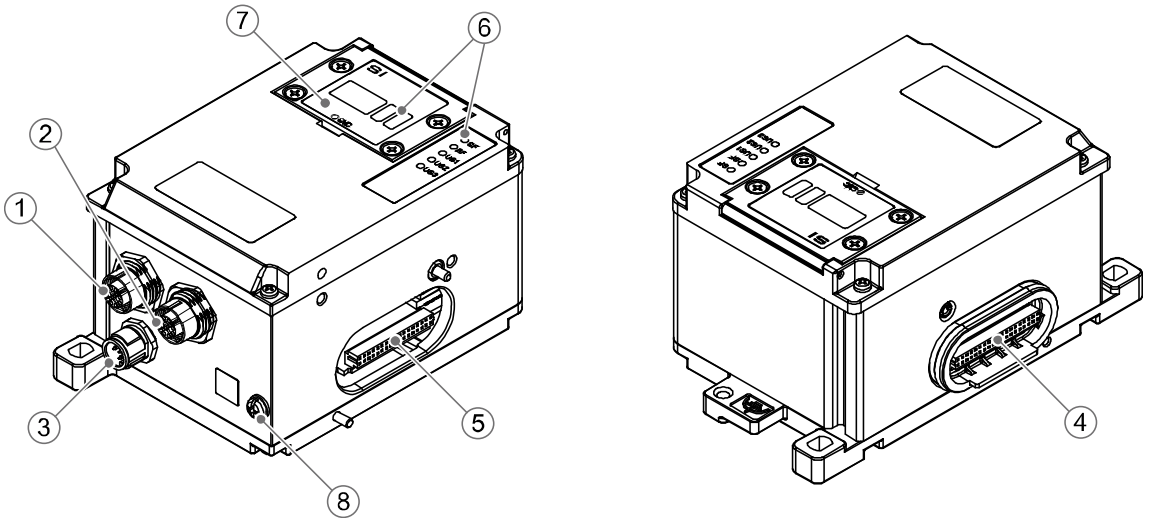
Model Indication and How to Order

EX250-SCF1-X200

- Special product
- Communication protocol

CF	CC-Link IE Field

Summary of Product elements



No.	Element	Description
1	Communication connector (PORT1 (P1))	Connect with CC-Link IE Field communication line. *1
2	Communication connector (PORT2 (P2))	
3	Power supply connector	Supplies power to the solenoid valve, the output block, SI unit and the input block. *1
4	Input block connector	Connects the input block.
5	Output block connector	Connects the solenoid valve, output block and etc.
6	Display	LED display shows the SI unit status. *2
7	Switch protective cover	Set Station no. and Network No. by using the switches under the cover. *2
8	Ground terminal (FE)	Used for grounding.

∗1: Refer to page 9 for Wiring.

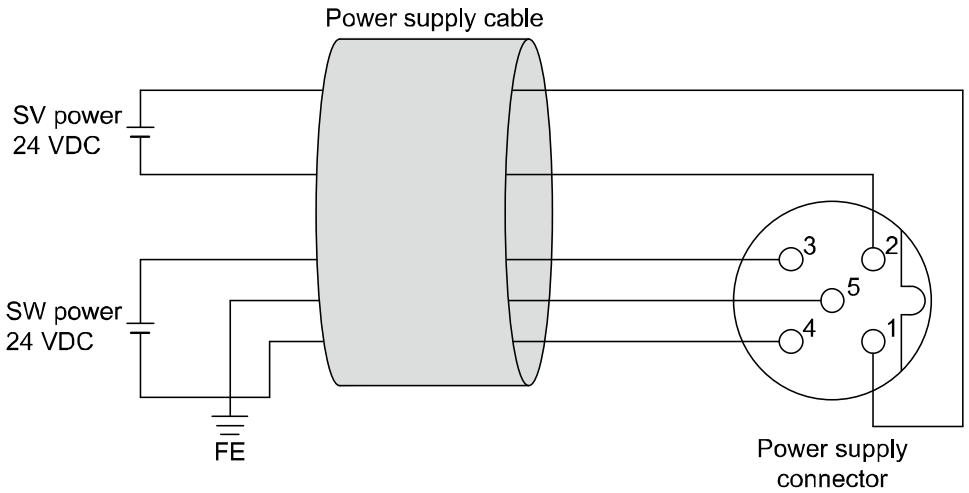
∗2: Refer to page 13 for the Setting.

Mounting and Installation

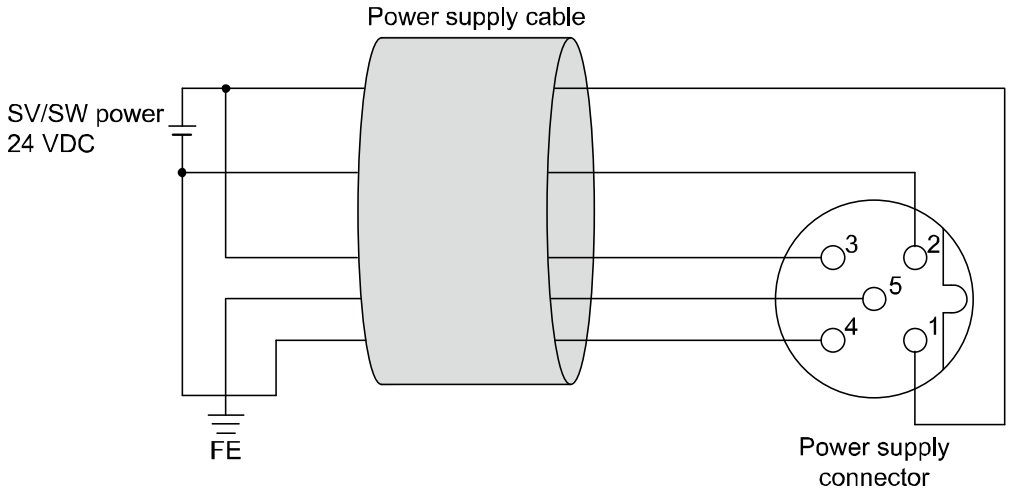
■Wiring

○Power supply wiring

Power supply line inside the SI unit has individual power supplies for solenoid valve actuation (SV power supply) and for control parts and input block (SW power supply). Supply 24 VDC for each of them.



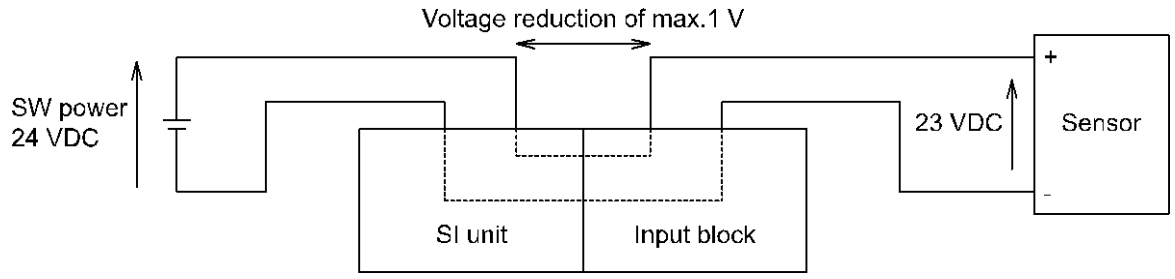
A. Dual power supply



B. Single power supply

∗: In case of single power supply, pay attention to the range of each supply voltage.

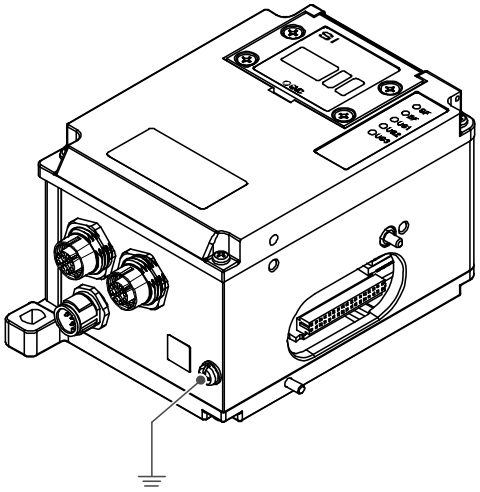
Power for sensor is supplied to sensor connected with input block. Select sensor concerning voltage drop up to maximum 1 V inside the unit at this moment.
If sensor requires 24 V, it is necessary to lower power supply voltage for sensor slightly or secure power supply for sensor separately without going through SI unit so that sensor input voltage can be 24 V with actual loading (allowable voltage of power supply: 19.2 to 28.8 V).



○Ground terminal

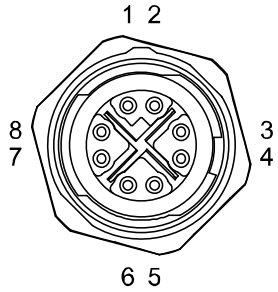
Connect the ground terminal to ground.

Resistance to ground should be 100 ohms or less.



○Communication connector

PORT1 (P1)/PORT2 (P2): M12 8pin socket X-Coding (CAT5e or more)

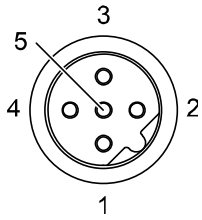


No.	Description	Function
1	TRD+ (0)	Data 0 is sent and received. (+)
2	TRD− (0)	Data 0 is sent and received. (−)
3	TRD+ (1)	Data 1 is sent and received. (+)
4	TRD− (1)	Data 1 is sent and received. (−)
5	TRD+ (3)	Data 3 is sent and received. (+)
6	TRD− (3)	Data 3 is sent and received. (−)
7	TRD− (2)	Data 2 is sent and received. (−)
8	TRD+ (2)	Data 2 is sent and received. (+)

Example of the cable with connector: NBC-MSX/1,0-94F SCO (Order No.1407467), 1 m
: NBC-MSX/2,0-94F SCO (Order No.1407468), 2 m
: NBC-MSX/5,0-94F SCO (Order No.1407469), 5 m etc.
(PHOENIX CONTACT)

○Power supply connector

PWR：M12 5pin Plug B-code



No.	Description	Function
1	SV24 V	+24 V power supply for solenoid valve
2	SV0 V	0 V power supply for solenoid valve
3	SW24 V	+24 V for power supply for control and input block
4	SW0 V	0 V for power supply for control and input block
5	E	Earth

Example of the cable with connector: EX9-AC010-1 (1 m)
EX9-AC030-1 (3 m)
EX9-AC050-1 (5 m) etc.
(manufactured by SMC)

○Maintenance

Addition of input block

•Remove the screws from the end plate to remove the plate.
•Mount the additional tie rods (supplied with the input block).
•Connect additional input block.
•Re-mount the end plate that was removed, and tighten the screws to the specified tightening torque. (0.6 Nm)

Replacing the SI unit

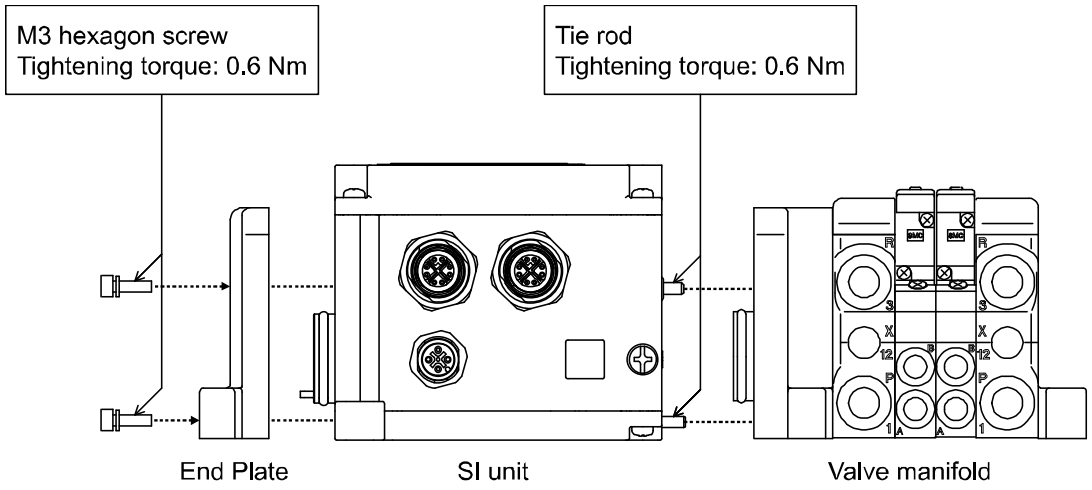
•Remove the screws from the end plate and release the connection with the valve unit.
•Replace the SI unit. (There is no need to remove the tie rod.)
•Re-mount the input block and end plate that was removed, and tighten the screws to the specified tightening torque. (0.6 Nm)

Precautions for maintenance

(1) Turn off the power supply completely.
(2) Check that there is no foreign matter inside the unit.
(3) Check that there is no damage and no foreign matter on the gasket.
(4) Tighten the screws to the specified torque.

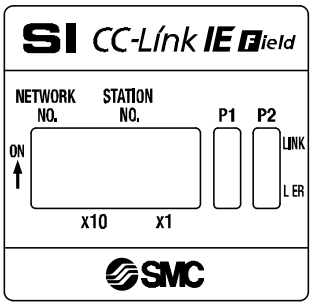
If the unit is not assembled correctly, this may cause product failure due to foreign matter such as liquid and dust which may get into the unit.

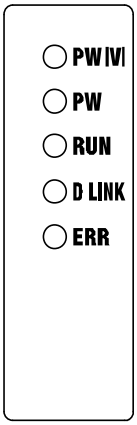
○Assembly and disconnection of unit



Setting

○LED indication

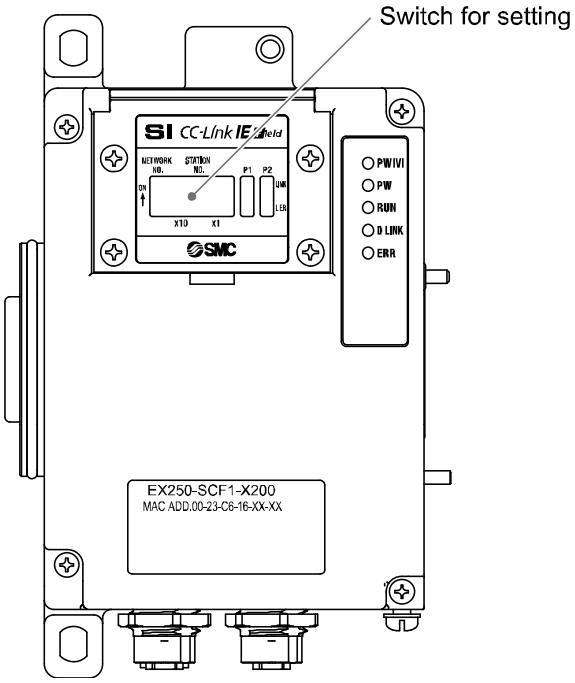




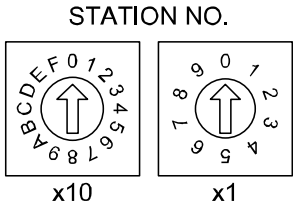
LED indication		LED status	Description	
PW(V) (Green)		ON	Normal power supply for solenoids	
		OFF	Insufficient power supply for solenoids (19 V or less)	
PW (Green)		ON	Normal mode	Normal power supply for control and input
		OFF		Insufficient power supply for control and input
		Flickering	Unit test mode	Test mode
		ON		Test normal mode end
RUN (Green)		ON	Operating normally	
		OFF	Node alarm occurs	
D LINK (Green)		ON	Cyclic transmission being performed	
		OFF	Cyclic transmission stopped	
ERR (Red)		ON	Disconnected, test failure end (Unit test mode)	
		OFF	Operating normally	
P1	LINK (Green)	ON	Link-up	
		OFF	Link-down	
	L ER (Red)	ON	Error frame received	
		OFF	Normal frame received	
P2	LINK (Green)	ON	Link-up	
		OFF	Link-down	
	L ER (Red)	ON	Error frame received	
		OFF	Normal frame received	

○Switch setting

Station No., Network No. are set by the switch inside of the SI unit cover.
Set parameters while the power of SI unit is OFF. The setting of each switches can be fixed after power is ON.



•Station number setting

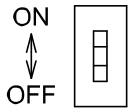


Setting	Setting range
x10	0 to C
x1	0 to 9

∗: The station number should be set within the range of 01 to C0 (120).
If the number is set to 00, or to C1 (121) or above, the “ERR” LED will turn on.
Turn the power off, and correct the setting.

∗: "ERR" display blinks if the switch is operated which the power is ON.

•Network No. setting



Setting	Description	Value
ON	1	Fixed value: 1
OFF	EEPROM SETTING	Set value

※：The value at shipment from the factory is “OFF”.

※：The value at shipment from the factory of EEPROM SETTING is “1”.

○I/O memory map and diagnostic information

(1) Occupation point of device parameter

Device type	Device name	Occupation size
Remote input	RX	32 points
Remote output	RY	32 points
Remote register	RWw	4 words
Remote register	RWr	4 words

(2) bit/word Area

•bit area

RX	Description	RY	Description
RX0	Input signal 0	RY0	Output signal 0
RX1	Input signal 1	RY1	Output signal 1
RX2	Input signal 2	RY2	Output signal 2
:	:	:	:
RX1F	Input signal 31	RY1F	Output signal 31

•word area

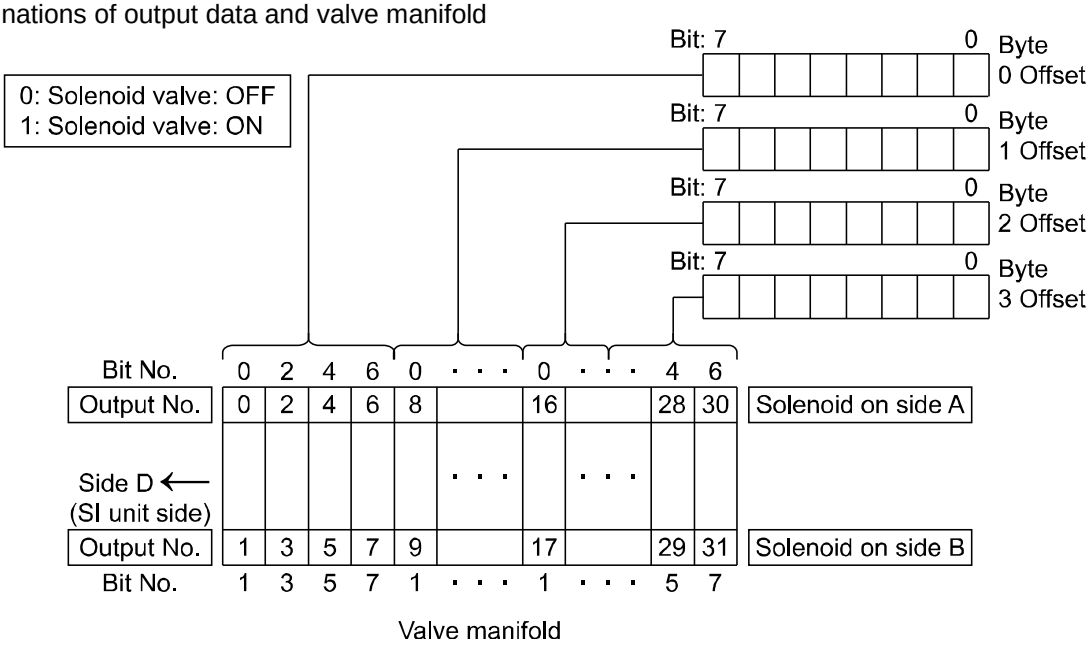
RWr	Details	RWw	Details
RWr0	System input	RWw0	Unused
RWr1	Error diagnostics (severe)	RWw1	Unused
RWr2	Error diagnostics (moderate)	RWw2	Unused
RWr3	Error diagnostics (light)	RWw3	Unused

•Diagnostics information details

Register	BitNo.	Description
RWr0	0	Reserved
	:	
	9	
	10	Error generation state flag
	11	Remove READY
	12	Reserved
	:	
	15	
RWr1	0	Unit internal error
	:	
	15	
RWr2	0	Unit internal error
	1	
	2	
	3	Node number address setting out-of-range
	4	Reserved
	:	
	15	
RWr3	0	Node number change
	1	Abnormal power supply for output
	2	Abnormal power supply for input
	3	Latest parameter not-reflected
	4	Network number change
	5	Reserved
	:	
	15	

○Output number assignment

Combinations of output data and valve manifold



∗: The output numbering refers to the solenoid position on the manifold and starts at zero.

∗: Standard wiring of the manifold is for double-solenoid valves and the output number starts at the A side and then B side in that order as shown in the figure a.

If a single-solenoid valve is mounted on the standard wiring manifold, the output number for the B side valve is skipped.

∗: Custom wiring for mixed mounting single-solenoid valves and double-solenoid valves can be specified with a Wiring Specification Sheet. Example wiring is shown in the figure b.

∗: Bit status “0” and ”1” in the data corresponds to solenoid valve status OFF and ON (0: OFF, 1: ON), and the output number starts at zero from LSB (least significant bit).

fig. a

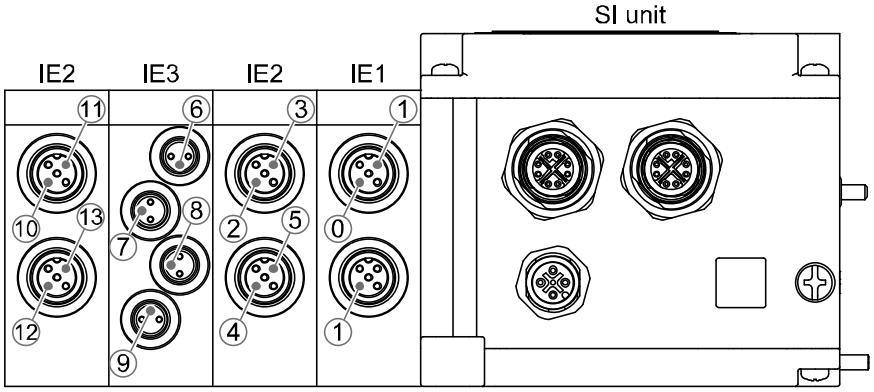
	No.	Station	No.	
Double	4	3	5	
Single	2	2	3	Free
Double	0	1	1	

fig. b

	No.	Station	No.
Double	3	3	4
Single	2	2	-
Double	0	1	1

○Input number assignment

Input numbers start from 0, and will be assigned to the input blocks in order from the SI unit mounted side.



Maintenance

•Mounting and wiring

Item to inspect	Criteria	Countermeasure
Confirm the connectors (communication, power supply) of SI unit securely connected.	No looseness.	Tighten the resistance.
Confirm the connecting cable broken.	No appearance error	If any error is found on the appearance, replace the cable.

•Replacement parts

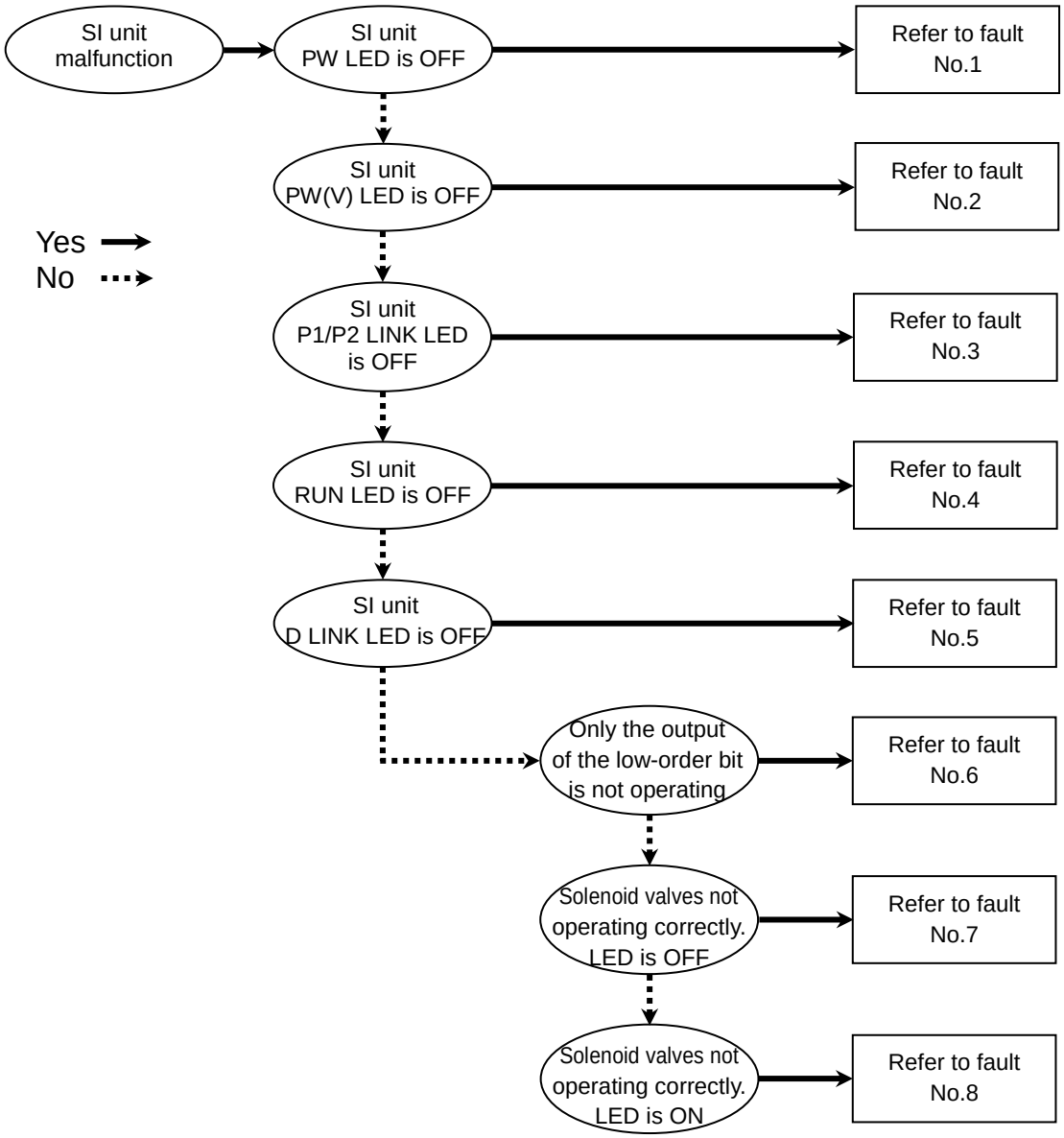
Item to inspect	Criteria	Countermeasure
CC-Link IE Field applicable cable for moving part (when used)	No error on the appearance and conductive resistance value	If any error is found on the appearance or the conductive resistance, replace the cable. See the specification of a cable to be used for the conductive resistance.
SI unit	No error in operation and display	If any error is found in the operation or on the display, replace the unit.

•Power supply

Item to inspect	Criteria	Countermeasure
Confirm the voltage satisfy the specified range. Measure the voltages at the both sides of the power supply for control and input block.	24 VDC ±20%	Investigate into the cause of voltage fluctuation, and take a countermeasure against it.
Confirm the voltage satisfy the specified range. Measure the voltages at the both sides of the power supply for solenoid valves.	24 VDC +10%/-5% (Refer to “Electrical and communication specifications” on page 22.)	Investigate into the cause of voltage fluctuation, and take a countermeasure against it.

Troubleshooting

When SI unit does not operate properly, follow the flow chart below and resolve it.



Failure Problem

Fault No.1

Problem	Possible cause	Investigation method	Countermeasures
SI unit PW LED is OFF	Incorrect wiring of the power supply for CC-Link IE Field	Check the power supply cable connections and check for broken wires.	Tighten the power supply cable connection. (If the cable has a broken wire, replace the cable).
			Correct the wiring of the power supply cable.
	Failure of the power supply for CC-Link IE Field	Check the power supply voltage of the CC-Link IE Field power supply.	Supply 24 VDC ±20% to the power supply for the SI unit control unit.

Fault No.2

Problem	Possible cause	Investigation method	Countermeasures
SI unit PW (V) LED is OFF	Wiring of the solenoid valve power supply is defective	Check the power supply cable connections and check for broken wires.	Tighten the power supply cable connection. (If the cable has a broken wire, replace the cable).
			Correct the wiring of the power supply cable.
	Solenoid valve power supply failure	Check proper supply voltage of solenoid valve power supply.	Supply 24 VDC 10%/-5% to the solenoid valve power supply.

Fault No.3

Problem	Possible cause	Investigation method	Countermeasures
SI unit P1/P2 LINK LED turned OFF	CC-Link IE Field communication error with the CC-Link IE Field device one level above	Check the condition of the CC-Link IE Field device one level above.	Check and Supply power to the CC-Link IE Field device one level above.
		Check the BUS IN side communication cable connections and check for broken wires.	Additionally tighten the communication cable wiring. (Replace the cable if it is broken.)
		Check that there are no high voltage cables or equipment that generates noise around the communication cable and SI unit.	Take measures to keep the communication cable and SI unit away from noise sources.

Fault No.4

Problem	Possible cause	Investigation method	Countermeasures
SI unit RUN LED is OFF	SI unit failure	Replace the SI unit with a new one and operate to check the normal operation recovers.	Replace the SI unit with a new one.

Fault No.5

Problem	Possible cause	Investigation method	Countermeasures
SI unit D LINK LED turned OFF	Out of node number setting range	Check if the node number is outside of the node number setting range.	Set the node number within the setting range.
	Node number setting duplication	Check if the node number is duplicated.	Set the node number so that it is not duplicated.
	Construction of the PLC program and the connected model is different.	Check that the program construction of the PLC and the connected model is the same.	Align the model setting to the PLC program construction.
	Node number not assigned	The node numbers assigned to the SI units are not registered in the PLC program.	Assign the SI unit node numbers to the PLC unit or connect the SI unit which is assigned in the PLC.

Fault No.6

Problem	Possible cause	Investigation method	Countermeasures
Only the output of the low-order bit is not operating.	No. of solenoids has exceeded the allowable number	Check that the number of solenoids has not exceeded the allowable number. The allowable number depends on the SI unit model and solenoid valve series. Number of solenoids that can be mounted: SY/SV/SO700 series: 32 points VQC series: 24 points	Change the number of solenoids to within the specification.

Fault No.7

Problem	Possible cause	Investigation method	Countermeasures
Solenoid valves do not operate correctly, solenoid valve LED is OFF	Defective connection between the SI unit and solenoid valve manifold	Check that the screws which connect the SI unit and the solenoid valve are not loose.	Tighten the screws while holding the SI unit and the solenoid valve manifold so that there is no gap between them. Tighten the screws to the specified torque. (Tighten the screws: 0.6 Nm)
	Polarity of the solenoid valve and the SI unit output are not compatible	Check that the solenoid valve polarity specification and output polarity of the SI unit are compatible.	Use a solenoid valve polarity compatible with the output polarity of the SI unit.
	Solenoid valve failure	Refer to the troubleshooting of the solenoid valve.	Refer to the troubleshooting of the solenoid valve.

Fault No.8

Problem	Possible cause	Investigation method	Countermeasures
Solenoid valves do not operate correctly, solenoid valve LED is ON	Polarity of the solenoid valve and the SI unit output are not compatible	Check that the solenoid valve polarity specification and output polarity of the SI unit are compatible.	Use a solenoid valve polarity compatible with the output polarity of the SI unit.

Specification

■Specifications

General specification

Item	Specifications
Ambient temperature	-10 to 50 ºC
Ambient humidity	35 to 85% RH (no condensation)
Storage temperature	-20 to 60 ºC
Withstand voltage	500 VAC applied for 1 minute
Insulation resistance	500 VDC, 10 MΩ or more
Operating atmosphere	No corrosive gas
Enclosure	IP65
Standard	CE marked
Weight	800 g or less

Electrical • Communication specification

Item		Specifications
Applicable system		CC-Link IE Field
Station type		Remote device station
Baud rate		1 Gbps
Station number assignment range		1 to 120
Network number assignment range		1 to 239
Configuration file		CSP+
Power supply voltage	Power supply for control and input block	19.2 to 28.8 VDC (24 VDC±20%)
	Solenoid valve	22.8 to 26.4 VDC(24 VDC+10%/-5%)
Input specification	Input points	32 points
	Applicable block	Input block *1
	Power supply for block	Max.1 A
Output specification	Output points	32 points
	Output type	Source / PNP (negative common)
	Applicable block	Solenoid valve with surge voltage suppressor of 24 VDC and 1.5 W or less (manufactured by SMC) Output component *1
	Residual voltage	0.3 VDC or less
	Load current	Max. 2 A
Internal current consumption(Unit)		0.3 A or less

∗1: Applicable block

Part number		Remarks
Input block	EX250-IE1	M12 connector, 2 inputs
	EX250-IE2	M12 connector, 4 inputs
	EX250-IE3	M12 connector, 2 inputs
Output component	EX9-OET1 *2	M12 connector, 2 outputs, source / PNP (negative common) low wattage load
	EX9-OEP1	M12 connector, 2 outputs, source / PNP (negative common) high wattage load
	EX9-PE1 *2	M12 connector, power block

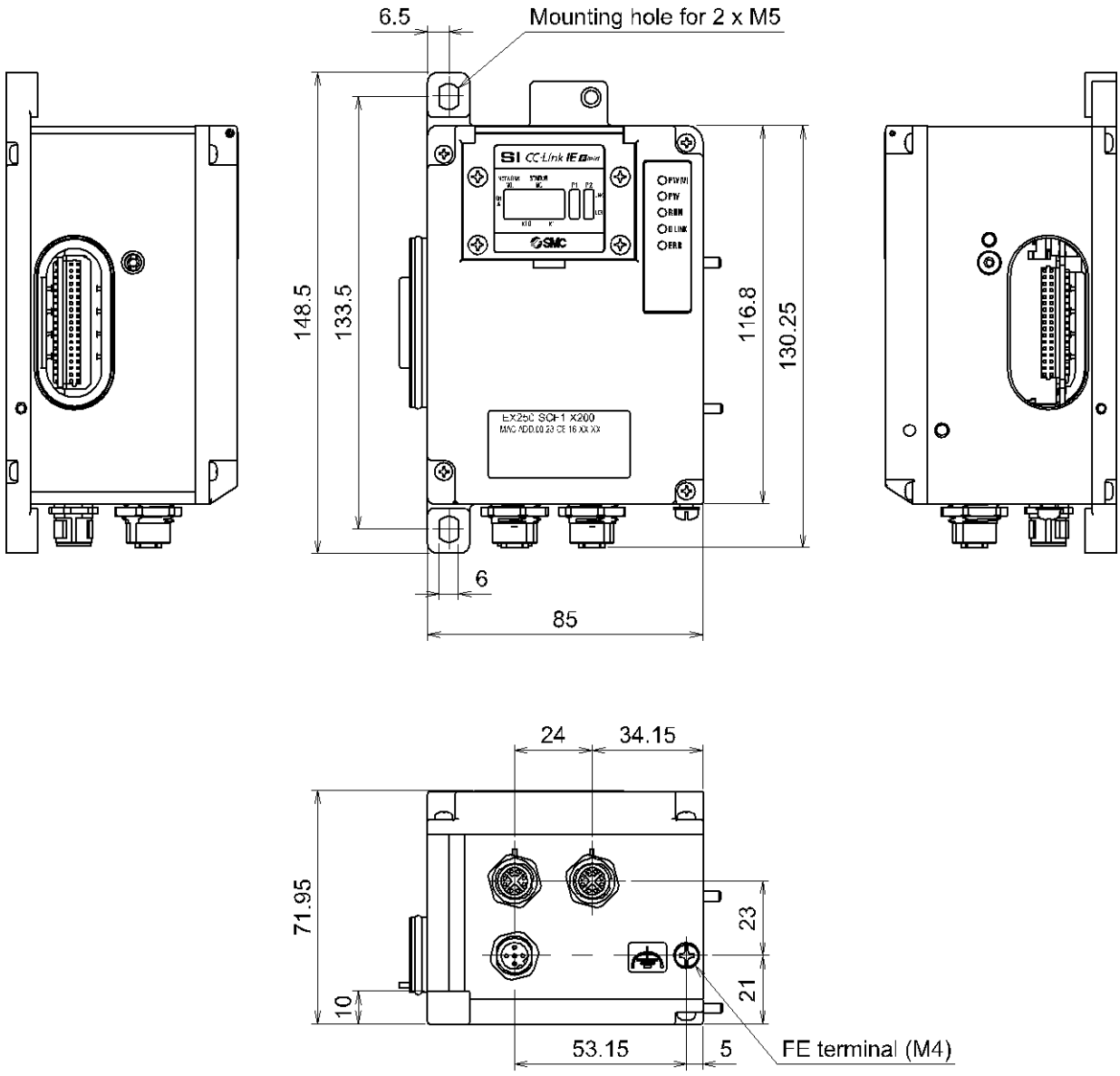
∗2: Applicable output component to one station on U side.

Part number	Remarks
EX9-OET1-X31	CC-Link IE Field compatible
EX9-PE1-X31	

Applicable solenoid valves

Representative series	Applicable series
SY series	SY3000, SY5000, SY7000
VQC series	VQC1000, VQC2000, VQC4000
SV series	SV1000, SV2000, SV3000 (Tie rod base manifold)
S0700 series	S0700

■Dimensions


6.5
Mounting hole for 2 x M5
148.5
133.5
116.8
130.25
6
85
24
34.15
71.95
23
21
10
53.15
5
FE terminal (M4)

Option

1. Power supply cable

How to order

EX9-AC 010 -1

• Cable length

010	1 m
030	3 m
050	5 m

Cable outer diameter	ϕ6.4
Wire gauge	0.3 mm²/AWG22
Wire outer diameter	1.65 mm
Minimum bending radius	40 mm (Fixed)

2. End plate (Input block side)

How to order

EX250-EA 1

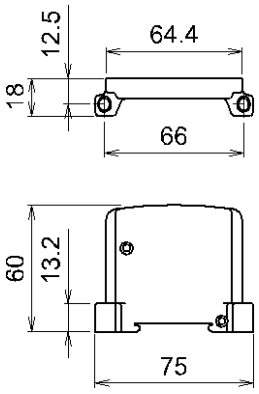
• Mounting method

1	Standard product
2	For DIN rail mounting

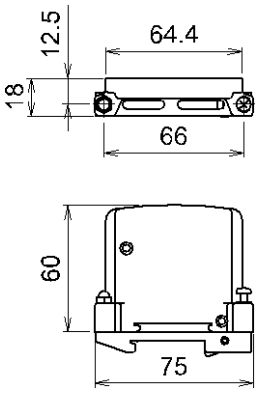
Accessory

Hexagon thin socket head bolt (2 pcs.)

EX250-EA1



EX250-EA2



3. End Plate R (Output side)

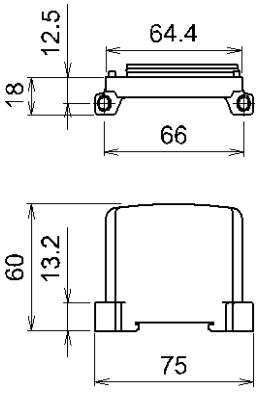
How to order

EX9-EA 03

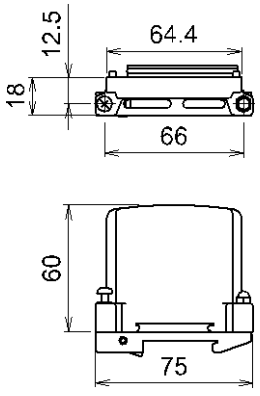
• Mounting method

03	Standard product
04	For DIN rail mounting

EX9-EA03



EX9-EA04



4. Waterproof cap

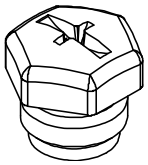
Mounted on the unused ports of the Input block, Output block and Power block.
Proper use of this waterproof cap can achieve IP67 enclosure. (The waterproof caps are delivered together with the Power block as accessories.)

How to order

EX9-AW □

• Connector specification

ES	M8 connector (for socket)/10 pcs.
TS	M12 connector (for socket)/10 pcs.



Note
Tighten the waterproof cap with the specified tightening torque. (0.05 Nm for M8,0.1 Nm for M12)

Revision history

SMC Corporation

4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021 JAPAN
Tel: + 81 3 5207 8249 Fax: +81 3 5298 5362
URL http://www.smcworld.com

No.EX※※-OMU1012